



Book Review

Genes: A philosophical inquiry. By Gordon Graham
Routledge, London, 2002.

Reviewed by Michael Bradie

This is a strange and ultimately unsatisfying book. It is an examination of the self-image created by the slogan “It’s all in the genes.” One reason that the analysis is ultimately unsatisfying is due to Graham’s decision to focus his philosophical analysis on popular expositions of genetics and biotechnology and the way in which these expositions shape a popular understanding of the implications of modern genetic. Thus, much of the book is spent on a critique of a simplistic version of ‘universal Darwinism’ as espoused by Richard Dawkins in his popular writings. While there are some interesting points raised, a general reader will come away with a distorted view of the science, the associated technologies and the pressing moral concerns raised by them.

The target audience is the intelligent non-specialist. What is such a person to make of the debates that rage around the claim that “it’s all in the genes?” Graham poses three central questions concerning this slogan: [1] What is the “it” that allegedly is “in the genes?”, [2] What is the force of the “all” in “all in the genes?”, and [3] What is the social significance of the truth or falsity of the slogan?

The central framework of the book is

the acknowledgement of the power of icons and images to shape our understanding and our sympathies. The slogan “It’s all in the genes” in all its various manifestations creates a self-image that shapes how we think of ourselves. What, Graham wants the reader to consider, should that self-image be?

The author tackles this question from a broadly philosophical perspective. He begins by noting that the general self-image of our modern age includes a tension between two visions of science and technology represented by Einstein, on the one hand – the power of science to produce understanding, and Frankenstein, on the other, the danger of technology run amok.

He proposes a philosophical examination of these icons – in particular, how they are played out in genetics – in hopes that it will prompt the reader into a reassessment of our understanding of science and technology (p. 9).

He begins with some reflections on the difference between the phrases “my philosophy” and “my science.” The one sounds legitimate to us, the other not despite the long etymology where what are now paradigmatic “sciences” were once “natural philosophies,”

while the term “science” which used to connote any organized knowledge has now assumed a more special sense. What makes science, as we now understand it, special? What makes science, as we now understand it, so special is its power to produce rational explanations, on the one hand, and to underwrite engineering practices, on the other. One of the themes of the book is to point out how the effectiveness of sciences in producing practical consequences is a result of the rationality of scientific practice.

The author is at pains to point out that although his book is a critique of modern genetics and the associated biotechnologies that have sprung from it, it is not to be understood as a “post-modern” rejection of modern science or its technologies. The focus, he insists, is on understanding biotechnology not undermining it (p. 20).

Science, Graham, suggests, hold a pre-eminent place in our modern self-image. This pre-eminence, he argues, is deserved only if two theses are true: [1] Natural science can do without divine agency, and [2] There is nothing that science cannot explain (p. 22). The significance of these requirements emerges in the course of the chapters specifically devoted to genetics and genetic engineering. These seem like impossibly high standards and one may well take issue with them. Appeals to divine agency are intrinsically dicey and I shall return to this point in due time. But, the second requirement seems inordinately strong. Surely, one can maintain that scientific rationality and the associated technologies it produces have had such a profound positive impact on the world as we know it (regardless of any negative impacts) that they are justifiably pre-eminent elements of our modern self image regardless of whether there are aspects of the natural world that science cannot explain.

With these preliminary remarks about icons, self-images and critical assessment under our belts, the author proceeds to an examination, in chapter 2, of the claims allegedly made by modern genetics to “explain” everything.

Chapter 3, “Genetic Engineering,” looks at genetics as an engineering tool and chapter 4, “Playing God,” raises the question of what values ought to shape our use of the potential of genetic engineering in the light of the realization that what is useful need not be valuable and what is valuable need not be useful.

Chapter 2, “Genetic explanation,” begins with a characterization of the debate between Darwinism and creationism. Graham identifies four claims that he takes to be characteristic of modern Darwinism: [1] the claim that evolution had occurred; [2] the claim that biotic evolution is a result of natural selection acting upon genetic variation; [3] the claim that evolution is gradual; and [4] the claim that the basis of life is fundamentally genetic (p. 32f). On Graham’s view, the “fatal flaw” of modern creationism is its denial of the fact of evolution. The evidence, he thinks, is overwhelmingly in favor of this fact and anti-Darwinists who fail to take this into account are up the creek without a paddle. Nonetheless, he points out, even if creationist alternatives are false, this does not establish the triumph of Darwinism. Modern (neo-) Darwinism is, he claims, following Dawkins, a mixture of genetics, game theory and evolution. Dawkins, he notes, has argued that there is nothing that modern Darwinism cannot explain. Graham challenges this view by looking at four realms – the zoological, the biochemical, the psychological and the cultural.

Before proceeding to an examination of the explanatory power of modern Darwinism, Graham pauses to consider whether the concept “the survival of the fittest” is circular. Graham points out that ‘fitness’ is a relational concept that is a function not only of genetic traits but of environments as well. However, he takes the need to include environmental considerations and historical contingencies as a point against Dawkins’s claim that Darwinism is a universal explanation. But, if the universal explanatory power of modern Darwinism is committed to the view that *absolutely* nothing can be appealed to but the genes, then surely not even

Dawkins would subscribe to this.

The discussion of the zoological realm focuses on the difficulties posed by altruism, homosexuality, and sterility. The discussion of the biochemical realm focuses on Behe's rejection of gradualism on the grounds that there are mechanisms of 'irreducible complexity'. After briefly surveying Behe's claims, Graham concludes that no definitive case has been made for the need to appeal to mechanisms of irreducible complexity to explain evolution. But, he wonders, what about the origin of life? Perhaps, he suggests, some non-Darwinian mechanisms need be invoked here. Well, perhaps they do, but that is hardly surprising since Darwin did not use the principle of natural selection to explain the *origin of life*, but only used it as one mechanism (among others) to account for the origin of species, the development of diversity and the like.

This discussion, and similar others throughout the book, are typical of what I take to be problematic about Graham's approach. He singles out Dawkins as promoting the view that Darwinism is a Universal Explanation of Everything. He then proceeds to argue that certain aspects of certain phenomena cannot be accounted for in any obvious manner by Darwinism as we currently understand it. Even allowing for the fact that future developments may lead to an improved version of neo-Darwinism, let us concede that, at the end of the day, Universal Darwinism, in some Dawkinsian version, is not sufficient to explain everything. But, so what? Perhaps the explanation of the origin of life will appeal to principles of thermodynamics (surely, even the most uncharitable interpretation of Dawkins cannot presume that he meant to suggest that the laws of physics are to be explained by Darwinian principles). Perhaps there is no one unified science or set of principles that can explain everything. I don't see how it follows that this detracts from the power of the Darwinian point of view to explain a great deal. And this, it would seem to me, is sufficient to justify the pre-

eminence of the Darwinian perspective in modern genetics and evolutionary theory.

The discussion of Darwinian psychology rehearses many of the standard objections that are raised with respect to this approach and which should be familiar to readers of this review. His text for this critique is E. O. Wilson's *On Human Nature*, an admittedly popular account of the promise of sociobiology. But, the clincher for Graham is the fact that evolutionary psychology is committed to naturalism and he has serious reservations about the ability of naturalistic explanations to account for "mentality" (p. 77).

There is a half hearted endorsement of the possibility of the need to invoke "irreducible complexities" but Graham notes, to his credit, that this is no warrant for the invocation of divine agency (p. 81). Three worries about evolutionary psychology, construed as a mutation of sociobiology are discussed. First, Graham wonders how natural selection connects up with mental development. Second, he cites the well known evidential problems – the lack of fossils and the problems associated with "reverse engineering" approaches. Finally, he questions the ability of this approach to adequately explain the evolution of culture. He is similarly dismissive of memetics as a general account of cultural change. Regardless of whether one takes imitation dynamics to be based on epidemiological models or models drawn from population genetics, there are chunks of culture, for example 'environmental awareness,' or 'arms reduction' that do not easily fit either model (pp. 86f). Perhaps not, but one problem with critiques such as this is that they impose an unfair burden on an immature science. Memetics is, at best, a science *in statu nascendi* and to expect an embryonic approach to handle sophisticated objections is to ask too much. Indeed, if Graham's point is that genetics or neo-Darwinism in its present form cannot completely explain everything it claims to be able to, then this is not surprising since no science is capable of doing this. I daresay we all

believe in the atomic theory of matter but no version of atomic theory, and certainly not quantum mechanics (often argued to be the most successful physical theory ever constructed) can give “complete explanations” of the structures and behavior of objects of the level of complexity that often are demanded by critics of genetics and evolutionary theory. The interesting question is whether there are any *in principle* objections to genetic and evolutionary accounts of animal behavior, human psychology or culture. There very well may be but nothing in Graham’s account gives us any reason to think so.

In chapter 3, “Genetic engineering,” Graham takes up the case for and against the practical ‘engineering’ effects wrought by modern genetics. Even if we concede that genetics is not the universal explanatory account some seem to make it out to be, Graham points out that there are practical effects of enormous significance including the possibility of genetic screening, the use and misuse of genetic information, the possibility of ‘designed organisms,’ cloning, stem cell research, and the environmental effects of genetically modified organisms. Graham’s basic line here is that these possibilities introduce no new technological or moral concerns. All engineering efforts and human interventions raise moral and technical problems. All our knowledge of genetics does is to increase our abilities to modify and shape our environments. But human beings have been doing this for eons. Sometimes these efforts result in improvements and other times they lead to problems. Graham makes the sensible observation that no blanket condemnation of biotechnology or genetic engineering is warranted. Each case must be evaluated on its own merits.

Graham dismisses four common objections that are often raised against genetic engineering. They are “that modern biotechnology has undesirable objectives, that it involves an unacceptable ‘tinkering’ with nature, that it is environmentally uncontrollable, and that the

research it requires is immoral” (p. 121). The possibility of catastrophic modifications leads critics to invoke what he calls a “precautionary principle” to the effect that one should be wary of introducing effects that might lead to such profound changes that we would not be able to reverse them even if we wanted to. Such possibilities are not limited to biotechnology, of course, but even so, Graham argues that appeal to this principle leads to a stalemate in that although action often leads to unintended and often undesirable outcomes, so does inaction.

The fourth objection, that the research involved is ‘immoral,’ stems from the fact that we have a tool that can be used to manipulate the human germ line and the genetic makeup of individuals. This raises fears that somehow such research violates a principle of the “sanctity of human life” and allows scientists to “play God.” The last chapter is devoted to considering what sense can be made of such worries in a secular age that no longer believes in God or in sanctity.

The last chapter, “Playing God,” is, by far, the most interesting chapter of the book. What could possibly be meant by “sanctity of life” in a secular age that no longer believes in the concept of sanctity? Some failed attempts to secularize the notion construe it along the lines of a ban on what Graham calls ‘generic trespassing (p 149).’ What rationales are offered for such a ban? One might construe the sanctity of life as a prohibition on what is contrary to nature. Graham rightly dismisses this approach. A second rationale might be provided by the ‘precautionary principle.’ But, that principle, he has earlier argued, is toothless when it comes to deciding on a course of action. Finally, one might object to genetic trespassing on pragmatic worries about the potential dangers of rapid change.

Graham suggests that we construe the ‘sanctity of life’ principle as the claim that all are equal in the eyes of God. A secular version of this claim would be the contention that ‘no one is in a position to decide that the life of an-

other is not worth living.’ Leaving aside whether this does or does not adequately capture the sense of the original principle, how does it apply to the kind of biotechnological issues that Graham is concerned with? He addresses this by looking at two cases – human cloning and designer babies.

One strong argument against creating human clones, he alleges, is that uncertainty about the effectiveness of human cloning raises the possibility that human embryos and fetuses would be created with significant deformities (p. 159). This may be so, but why isn’t this a version of the ‘nothing new’ defense that sought to defuse criticism of particular biotechnologies on the grounds that no new moral concerns were being introduced? If uncertainty about the viability of resulting embryos or fetuses is a reason for resisting human cloning then it is equally an argument against any procreative activity at all.

Setting that aside, Graham allows that techniques might be improved to the point where the uncertainties are tolerable. Are there, he asks, any theoretical arguments in favor of human cloning? He considers three potential lines of argument. First, it might be defended as a way of producing stem cells. Graham argues that there is no reason, on these grounds, not to use embryonic cells as opposed to aborted fetuses. Second, human cloning might be a method for alleviating childlessness. Graham rejects this partially on the grounds that the potential dangers of the technology are not clearly understood. Finally, one might argue for human cloning as a mode of creating designer babies. Graham rejects this as impractical at present. There may be improvements in the relevant technologies, however, so present impracticality does not address the *moral* issues

involved.

The moral issues, he argues, cannot be overcome. “Anyone who believes that he or she can engineer an improvement in the sorts of human being who are likely to arise from more *normal* [! my emphasis] processes must believe, first that they can predictably secure a certain outcome, second that this outcome is demonstrably superior, and third that their judgement of its superiority transcends or overrides the first-person judgements of the alternative, non-designed person (p. 181).” Graham claims that these are impossible conditions to satisfy but I am not convinced. Furthermore, even if I were convinced that *these* conditions cannot be satisfied, I do not see why any potential ‘human engineer’ *must* believe that they can be satisfied.

The bottom line, for Graham, is that the fracture in modern self-image created by the tension between the Einsteinian vision of rational understanding and the Frankensteinian image of biotechnology run amok can only be healed by an appeal to religion. It may be true that Darwinism *per se*, is no position to yield moral principles that can be used to shape the direction of our technological applications of modern genetics. However, it doesn’t follow that the only source of moral constraints is religion, as Graham’s final sentence suggests: “the secular mind that utterly rejects religion must rest content with a fractured image of science.”

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